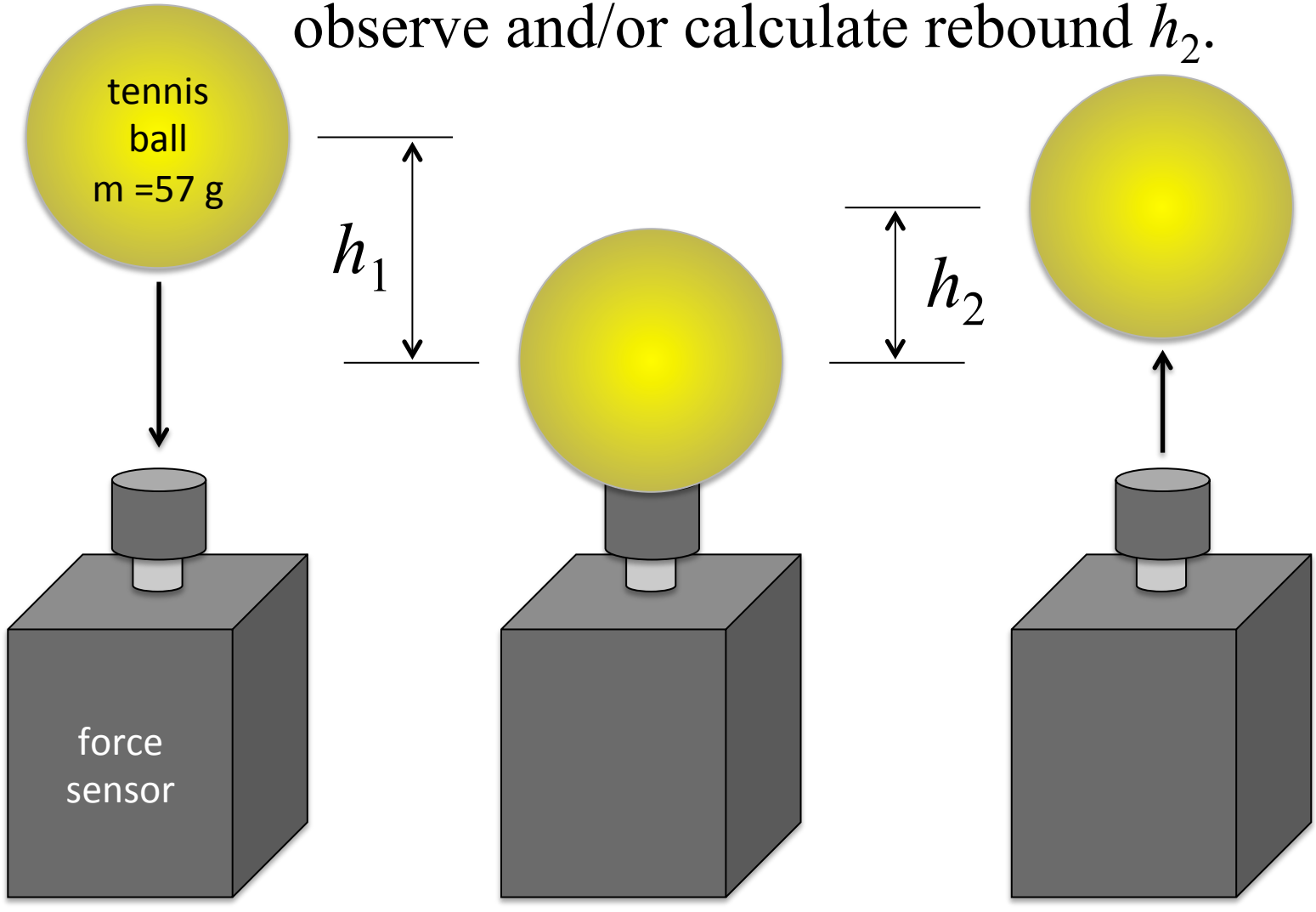
Mini-Lab: Impulse

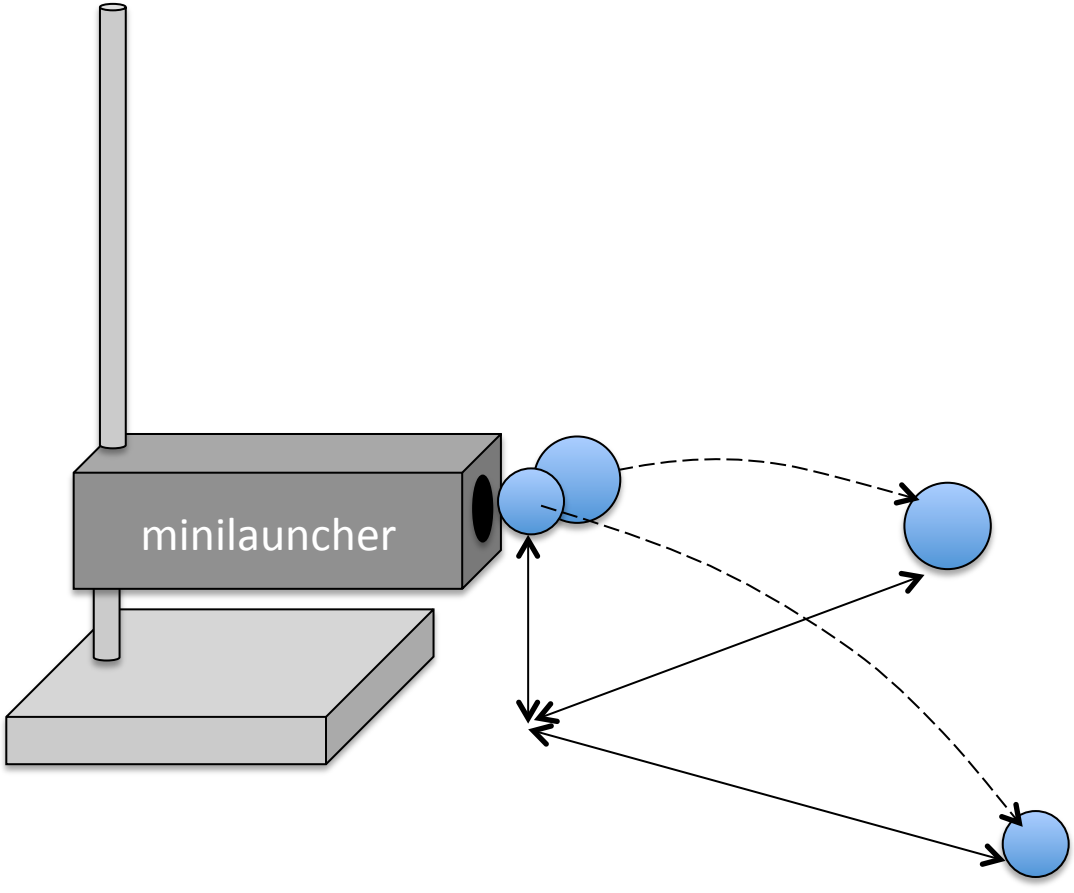
1. Goal is compare impulse and change in momentum.
2. Attach rubber bumper to force sensor, use ±10 N range.
3. Remove set-screw, hold sensor vertically resting on table, under Sensors menu choose Zero and Reverse.
4. Time setup: Duration = 0.25 s, Rate = 1000 samples/s, Enable Triggering – increasing across 0.1 N and collect 20 points before trigger.
5. Click Collect button, hold tennis ball 10 cm directly over the bumper and drop it so that it bounces straight up.
6. Find impulse by integration and by mean force and duration of impact – should be about the same. Compare by calculation impulse and heights of drop and rebound.

Measure and drop from height h_1, observe and/or calculate rebound h_2.



Mini-Lab: 2-D Collision

1. Goal is to verify conservation of momentum and assess elasticity. Optional: determine coefficient of restitution.
2. Attach minilauncher to ringstand and adjust so that barrel is horizontal at a height above floor 10 cm or less.
3. Launch the small steel ball and record the range and vertical displacement.
4. Adjust the "tee" to hold the larger steel ball so that it will be impacted by the small ball immediately after firing.
5. Record the range and direction angle (relative to the barrel) of each ball hitting the floor.
6. Use the measured values and the masses of the balls to calculate momentum and kinetic energy to achieve goals.


minilauncher